OIPE
SEP 0 5 2003
PATENT & TRADEMARK OFFICE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/830,502
Filing Date	October 29, 1999
First Named Inventor	Barany et al.
Group Art Unit	1652
Examiner Name	R. Hutson
Total Number of Pages in This Submission	
Attorney Docket Number	19603/2615 (CRF D-2408)

DAC $ Box 370 (5)

ENCLOSURES *(check all that apply)*

- ☒ Fee Transmittal Form
- ☒ Fee Attached
- ☐ Amendment / Reply
- ☐ After Final
- ☐ Affidavits/declaration(s)
- ☒ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
- ☐ A copy of the Notice to Missing Parts under 37 CFR 1.52 or 1.53

- ☐ Assignment Papers *(for an Application)*
- ☐ Drawing(s)
- ☐ Declaration and Power of Attorney
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____

- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Application Data Sheet
- ☐ Request for Corrected Filing Receipt with Enclosures
- ☒ A self-addressed, prepaid postcard for acknowledging receipt
- ☐ Other Enclosure(s) (*please identify below*):
- ☒ A copy of Notice to Comply
- ☒ Statement in Accordance with 37 C.F.R. § 1.821(g)
- ☒ Sequence Listing (16 pages)
- ☒ Computer readable 3.5" diskette containing sequences
- ☒ Notification Regarding Loss of Entitlement to Small Entity Status Pursuant to 37 CFR §§ 1.27(g)(2) and 1.28(c)

RECEIVED
SEP 9 2003
OFFICE OF PETITIONS

Remarks

☒ The Commissioner is hereby authorized to charge any additional fees required or credit any overpayments to Deposit Account No. 14-1138 for the above identified docket number.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm *or* Individual name	Michael L. Goldman Nixon Peabody LLP Clinton Square, P.O. Box 31051 Rochester, New York 14603-1051 Telephone: (585) 263-1304 Fax: (585) 263-1600
Signature	Michael L. Goldman
Date	September 2, 2003

CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]

I hereby certify that this correspondence is being:

☒ deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Sequence, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450

☐ transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at (703) _____.

9/3/03
Date

Wendy L. Barry
Signature

Wendy L. Barry
Typed or printed name

FEE TRANSMITTAL FOR FY 2003

Patent fees are subject to annual revision.

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	($) 315

Complete if Known

Application Number	09/830,502
Filing Date	October 29, 1999
First Named Inventor	Barany et al.
Examiner Name	R. Hutson
Art Unit	1652
Attorney Docket No.	19603/2615 (CRF D-2408)

METHOD OF PAYMENT *(check all that apply)*

☒ Check ☐ Credit Card ☐ Money Order ☐ Other ☐ None

☐ Deposit Account:

Deposit Account Number: 14-1138

Deposit Account Name: Nixon Peabody LLP

The Commissioner is authorized to: *(check all that apply)*

☐ Charge fee(s) indicated below ☒ Credit any overpayments

☒ Charge any additional fee(s)

☐ Charge fee(s) indicated below, **except for the filing fee** to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	750	2001	375	Utility filing fee	
1002	330	2002	165	Design filing fee	
1003	520	2003	260	Plant filing fee	
1004	750	2004	375	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($) 0

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

		Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =		X	=	0
Independent Claims		-3** =		X	=	0
Multiple Dependent				X	=	0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	84	2201	42	Independent claims in excess of 3
1203	280	2203	140	Multiple dependent claim, if not paid
1204	84	2204	42	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	
1051	130	2051	65	Surcharge – late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	110
1252	410	2252	205	Extension for reply within second month	
1253	930	2253	465	Extension for reply within third month	
1254	1,450	2254	725	Extension for reply within fourth month	
1255	1,970	2255	985	Extension for reply within fifth month	
1401	320	2401	160	Notice of Appeal	
1402	320	2402	160	Filing a brief in support of an appeal	
1403	280	2403	140	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive – unavoidable	
1453	1,300	2453	650	Petition to revive – unintentional	
1501	1,300	2501	650	Utility issue fee (or reissue)	
1502	470	2502	235	Design issue fee	
1503	630	2503	315	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	750	2809	375	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	750	2810	375	For each additional invention to be examined (37 CFR 1.129(b))	
1801	750	2801	375	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	
Other fee (specify) Entity Deficiency Payment					205

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 315

CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]

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☒ deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Sequence, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450

☐ transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at (703) _____

9/3/03
Date

Wendy L. Barry
Signature

Wendy L. Barry
Typed or printed name

SUBMITTED BY				Complete *(if applicable)*	
Name *(Print/Type)*	Michael L. Goldman	Registration No. *(Attorney/Agent)*	30,727	Telephone	(585) 263-1304
Signature	Michael L. Goldman			Date	September 2, 2003

SEND TO: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application No.: 10/830,502

NOTICE TO COMPLY WITH REQUIREMENTS FOR PATENT APPLICATIONS CONTAINING NUCLEOTIDE SEQUENCE AND/OR AMINO ACID SEQUENCE DISCLOSURES

The nucleotide and/or amino acid sequence disclosure contained in this application does not comply with the requirements for such a disclosure as set forth in 37 C.F.R. 1.821 - 1.825 for the following reason(s):

- [X] 1. This application clearly fails to comply with the requirements of 37 C.F.R. 1.821-1.825. Applicant's attention is directed to these regulations, published at 1114 OG 29, May 15, 1990 and at 55 FR 18230, May 1, 1990.
- [ ] 2. This application does not contain, as a separate part of the disclosure on paper copy, a "Sequence Listing" as required by 37 C.F.R. 1.821(c).
- [ ] 3. A copy of the "Sequence Listing" in computer readable form has not been submitted as required by 37 C.F.R. 1.821(e).
- [ ] 4. A copy of the "Sequence Listing" in computer readable form has been submitted. However, the content of the computer readable form does not comply with the requirements of 37 C.F.R. 1.822 and/or 1.823, as indicated on the attached copy of the marked -up "Raw Sequence Listing."
- [ ] 5. The computer readable form that has been filed with this application has been found to be damaged and/or unreadable as indicated on the attached CRF Diskette Problem Report. A Substitute computer readable form must be submitted as required by 37 C.F.R. 1.825(d).
- [ ] 6. The paper copy of the "Sequence Listing" is not the same as the computer readable from of the "Sequence Listing" as required by 37 C.F.R. 1.821(e).
- [X] 7. Applicants sequence listing submission lists discriptor <223> as a probe or primer for protein sequences. Protein sequences cannot be "probe or primer".

Applicant Must Provide:

- [X] An initial or **substitute** computer readable form (CRF) copy of the "Sequence Listing".
- [X] An initial or **substitute** paper copy of the "Sequence Listing", as well as an amendment directing its entry into the specification.
- [X] A statement that the content of the paper and computer readable copies are the same and, where applicable, include no new matter, as required by 37 C.F.R. 1.821(e) or 1.821(f) or 1.821(g) or 1.825(b) or 1.825(d).

For questions regarding compliance to these requirements, please contact:

For Rules Interpretation, call (703) 308-4216
For CRF Submission Help, call (703) 308-4212
For PatentIn software help, call (703) 308-6856

PLEASE RETURN A COPY OF THIS NOTICE WITH YOUR RESPONSE

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Offic
COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.

EXAMINER	
ART UNIT	PAPER NUMBER
	13

DATE MAILED:

Pl ase find below a communication from the EXAMINER in charge of this application
Commissioner of Patents

This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR 1.821 through 1.825 for the reason(s) set forth: As indicated on the attached Notice to Comply, the discriptor <223> cannot list "probe or primer" for protein sequences. See the attached Notice To Comply With Requirements For Patent Applications Containing Nucleotide Sequence And/Or Amino Acid Sequence Disclosures.

Any inquiry concerning this communication should be directed to Examiner Richard Hutson, Art Unit 1652, whose telephone number is (703) 308-0066.

Any inquiry of a general nature or relating to the status of this application should be directed to the Customer Service Center whose telephone number is (703) 308-0196.

APPLICANT IS GIVEN ONE MONTH FROM THE DATE OF THIS LETTER WITHIN WHICH TO COMPLY WITH THE SEQUENCE RULES, 37 CFR 1.821 - 1.825. Failure to comply with these requirements will result in ABANDONMENT of the application under 37 CFR 1.821(g). Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136. In no case may an applicant extend the period for response beyond the six month statutory period. Applicant is requested to return a copy of the attached Notice to Comply with the response.

Richard Hutson, Ph.D.
Primary Examiner
Art Unit 1652
7/1/2003

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,502	10/09/2001	Francis Barany	19603/2615	8225

7590 07/03/2003

Michael L Goldman
Nixon Peabody
Clinton Square P O Box 31051
Rochester, NY 14603

EXAMINER
HUTSON, RICHARD G

ART UNIT	PAPER NUMBER
1652	13

DATE MAILED: 07/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

#12
1/3
6/20/05

RAW SEQUENCE LISTING DATE: 05/22/2003
PATENT APPLICATION: US/09/830,502A TIME: 11:10:39

Input Set : A:\C26151.app
Output Set: N:\CRF4\05222003\I830502A.raw

199 attgaggaga ggacgggcaa ggacccaagg gccctcacgg cctag 2025
202 <210> SEQ ID NO: 3
203 <211> LENGTH: 20
204 <212> TYPE: DNA
205 <213> ORGANISM: Artificial Sequence
207 <220> FEATURE:
208 <223> OTHER INFORMATION: Description of Artificial Sequence: probe or
209 primer
211 <220> FEATURE:
212 <221> NAME/KEY: tRNA
213 <222> LOCATION: (4)
214 <223> OTHER INFORMATION: w at position 4 can be T or A
216 <220> FEATURE:
217 <221> NAME/KEY: unsure
218 <222> LOCATION: (5)
219 <223> OTHER INFORMATION: s at position 5 can be C or G
221 <220> FEATURE:
222 <221> NAME/KEY: unsure
223 <222> LOCATION: (12)
224 <223> OTHER INFORMATION: s at position 12 can be C or G
226 <220> FEATURE:
227 <221> NAME/KEY: unsure
228 <222> LOCATION: (15)
229 <223> OTHER INFORMATION: r at position 15 can be G or A
231 <220> FEATURE:
232 <221> NAME/KEY: unsure
233 <222> LOCATION: (18)
234 <223> OTHER INFORMATION: y at position 18 can be T or C
236 <400> SEQUENCE: 3
237 atcwscgacg csgartayga 20
240 <210> SEQ ID NO: 4
241 <211> LENGTH: 7
242 <212> TYPE: PRT
243 <213> ORGANISM: Artificial Sequence
245 <220> FEATURE:
246 <223> OTHER INFORMATION: Description of Artificial Sequence: probe or
247 primer
249 <400> SEQUENCE: 4
250 Ile Ser Asp Ala Glu Tyr Asp
251 1 5
254 <210> SEQ ID NO: 5
255 <211> LENGTH: 20
256 <212> TYPE: DNA
257 <213> ORGANISM: Artificial Sequence
259 <220> FEATURE:
260 <223> OTHER INFORMATION: Description of Artificial Sequence: probe or
261 primer
263 <220> FEATURE:
264 <221> NAME/KEY: unsure

Protein cannot be probe or primer

RAW SEQUENCE LISTING DATE: 05/22/2003
PATENT APPLICATION: US/09/830,502A TIME: 11:10:39

Input Set : A:\C26151.app
Output Set: N:\CRF4\05222003\I830502A.raw

265 <222> LOCATION: (3)
266 <223> OTHER INFORMATION: s at position 3 can be C or G
268 <220> FEATURE:
269 <221> NAME/KEY: unsure
270 <222> LOCATION: (6)
271 <223> OTHER INFORMATION: s at position 6 can be C or G
273 <220> FEATURE:
274 <221> NAME/KEY: unsure
275 <222> LOCATION: (8)
276 <223> OTHER INFORMATION: k at position 8 can be G or T
278 <220> FEATURE:
279 <221> NAME/KEY: unsure
280 <222> LOCATION: (9)
281 <223> OTHER INFORMATION: s at position 9 can be G or C
283 <220> FEATURE:
284 <221> NAME/KEY: unsure
285 <222> LOCATION: (12)
286 <223> OTHER INFORMATION: s at position 12 can be G or C
288 <220> FEATURE:
289 <221> NAME/KEY: unsure
290 <222> LOCATION: (15)
291 <223> OTHER INFORMATION: y at position 15 can be C or T
293 <220> FEATURE:
294 <221> NAME/KEY: unsure
295 <222> LOCATION: (18)
296 <223> OTHER INFORMATION: r at position 18 can be A or G
298 <400> SEQUENCE: 5
299 ccsgtscksc csacytgraa 20
302 <210> SEQ ID NO: 6
303 <211> LENGTH: 20
304 <212> TYPE: DNA
305 <213> ORGANISM: Artificial Sequence
307 <220> FEATURE:
308 <223> OTHER INFORMATION: Description of Artificial Sequence: probe or
309 primer
311 <220> FEATURE:
312 <221> NAME/KEY: unsure
313 <222> LOCATION: (9)
314 <223> OTHER INFORMATION: v at position 9 can be C, G, or A
316 <220> FEATURE:
317 <221> NAME/KEY: unsure
318 <222> LOCATION: (11)
319 <223> OTHER INFORMATION: r at position 11 can be A or G
321 <220> FEATURE:
322 <221> NAME/KEY: unsure
323 <222> LOCATION: (12)
324 <223> OTHER INFORMATION: y at position 12 can be T or C
326 <220> FEATURE:
327 <221> NAME/KEY: unsure

RAW SEQUENCE LISTING ERROR SUMMARY DATE: 05/22/2003
PATENT APPLICATION: US/09/830,502A TIME: 11:10:40

Input Set : A:\C26151.app
Output Set: N:\CRF4\05222003\I830502A.raw

Please Note:
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:15; Xaa Pos. 18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
Seq#:15; Xaa Pos. 37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55
Seq#:15; Xaa Pos. 56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74
Seq#:15; Xaa Pos. 75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93
Seq#:15; Xaa Pos. 94,95,96,97,98,99,100,101,102,103,104,105,106,107,108,109
Seq#:15; Xaa Pos. 110,111,112,113,114,115,116,117,118,119,120,126,127,128
Seq#:15; Xaa Pos. 129,130,131,132,133,134,135,136,137,138,139,140,141,142
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Seq#:15; Xaa Pos. 171,172
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Seq#:16; Xaa Pos. 37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55
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Seq#:16; Xaa Pos. 94,95,96,97,98,99,100,101,102,103,104,105,106,107,108,109
Seq#:16; Xaa Pos. 110,111,112,113,114,115,116,117,118,119,120,129,130,131
Seq#:16; Xaa Pos. 132,133,134,135,136,137,138,139,140,141,142,143,144,145
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Seq#:18; Xaa Pos. 18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
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Seq#:18; Xaa Pos. 75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93
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Seq#:18; Xaa Pos. 129,130,131,132,133,134,135,136,137,138,139,140,141,142
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Seq#:18; Xaa Pos. 157,158,159,160,161,162,163,164,165,166,167,168,169,170
Seq#:18; Xaa Pos. 171,172
Seq#:19; Xaa Pos. 18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36
Seq#:19; Xaa Pos. 37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55
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RAW SEQUENCE LISTING ERROR SUMMARY DATE: 05/22/2003
PATENT APPLICATION: **US/09/830,502A** TIME: 11:10:40

Input Set : **A:\C26151.app**
Output Set: **N:\CRF4\05222003\I830502A.raw**

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Seq#:19; Xaa Pos. 143,144,145,146,147,148,149,150,151,152,153,154,155,156
Seq#:19; Xaa Pos. 157,158,159,160,161,162,163,164,165,166,167,168,169,170
Seq#:19; Xaa Pos. 171,172
Seq#:20; Xaa Pos. 18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36

VERIFICATION SUMMARY DATE: 05/22/2003
PATENT APPLICATION: **US/09/830,502A** TIME: 11:10:40

Input Set : **A:\C26151.app**
Output Set: **N:\CRF4\05222003\I830502A.raw**

L:470 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:15 after pos.:16
M:341 Repeated in SeqNo=15
L:523 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:16 after pos.:16
M:341 Repeated in SeqNo=16
L:576 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:17 after pos.:16
M:341 Repeated in SeqNo=17
L:629 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:18 after pos.:16
M:341 Repeated in SeqNo=18
L:682 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:19 after pos.:16
M:341 Repeated in SeqNo=19
L:735 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:20 after pos.:16
M:341 Repeated in SeqNo=20

STATISTICS SUMMARY DATE: 05/22/2003
PATENT APPLICATION: **US/10/085,418E** TIME: 14:24:44

Input Set : **N:\jumbos\10085418\PTOMS.txt**
Output Set: **N:\CRF4\05222003\J085418E.raw**

Application Serial Number: US/10/085,418E
Alpha or Numeric or Xml: Alpha
Application Class:
Application File Date: 02-28-2002
Art Unit: OIPE
Software Application: PatentIN1.0
Total Number of Sequences: 3
Total Nucleotides: 3729
Total Amino Acids: 0
Number of Errors: 0
Number of Warnings: 0
Number of Corrections: 2

MESSAGE SUMMARY

220 C: 2 (Keyword misspelled or invalid format)

re-edit
5/22/03

Does Not Comply
Corrected Diskette Needed
see page 4 & 6

1600

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/830,502A

DATE: 05/22/2003
TIME: 11:10:39

Input Set : A:\C26151.app
Output Set: N:\CRF4\05222003\I830502A.raw

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 3 <110> APPLICANT: Barany, Francis
 4       Cao, Weiguo
 5       Tong, Jie
 7 <120> TITLE OF INVENTION: HIGH FIDELITY THERMOSTABLE LIGASE AND USES THEREOF
 9 <130> FILE REFERENCE: 19603/2615
11 <140> CURRENT APPLICATION NUMBER: 09/830,502A
12 <141> CURRENT FILING DATE: 1999-10-29
14 <150> PRIOR APPLICATION NUMBER: 60/106,461
15 <151> PRIOR FILING DATE: 1998-10-30
17 <150> PRIOR APPLICATION NUMBER: PCT/US99/25437
18 <151> PRIOR FILING DATE: 1999-10-29
20 <160> NUMBER OF SEQ ID NOS: 20
22 <170> SOFTWARE: PatentIn Ver. 2.1
24 <210> SEQ ID NO: 1
25 <211> LENGTH: 674
26 <212> TYPE: PRT
27 <213> ORGANISM: Thermus sp.
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33 Ile Arg Tyr His Asn Tyr Leu Tyr Tyr Val Leu Asp Ala Pro Glu Ile
34              20                  25                  30
36 Ser Asp Ala Glu Tyr Asp Arg Leu Leu Arg Glu Leu Lys Glu Leu Glu
37          35                  40                  45
39 Glu Arg Phe Pro Glu Leu Lys Ser Pro Asp Ser Pro Thr Glu Gln Val
40      50                  55                  60
42 Gly Ala Arg Pro Leu Glu Ala Thr Phe Arg Pro Val Arg His Pro Thr
43  65                  70                  75                  80
45 Arg Met Tyr Ser Leu Asp Asn Ala Phe Ser Leu Asp Glu Val Arg Ala
46                  85                  90                  95
48 Phe Glu Glu Arg Ile Glu Arg Ala Leu Gly Arg Lys Gly Pro Phe Leu
49             100                 105                 110
51 Tyr Thr Val Glu Arg Lys Val Asp Gly Leu Ser Val Asn Leu Tyr Tyr
52         115                 120                 125
54 Glu Glu Gly Ile Leu Val Phe Gly Ala Thr Arg Gly Asp Gly Glu Thr
55     130                 135                 140
57 Gly Glu Glu Val Thr Gln Asn Leu Leu Thr Ile Pro Thr Ile Pro Arg
58 145                 150                 155                 160
60 Arg Leu Thr Gly Val Pro Asp Arg Leu Glu Val Arg Gly Glu Val Tyr
61                 165                 170                 175
63 Met Pro Ile Glu Ala Phe Leu Arg Leu Asn Gln Glu Leu Glu Glu Ala
64             180                 185                 190
66 Gly Glu Arg Ile Phe Lys Asn Pro Arg Asn Ala Ala Ala Gly Ser Leu
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67          195                 200                 205
69 Arg Gln Lys Asp Pro Arg Val Thr Ala Arg Arg Gly Leu Arg Ala Thr
70      210                 215                 220
72 Phe Tyr Ala Leu Gly Leu Gly Leu Glu Glu Thr Gly Leu Lys Ser Gln
73 225                 230                 235                 240
75 His Asp Leu Leu Leu Trp Leu Arg Glu Arg Gly Phe Pro Val Glu His
76                  245                 250                 255
78 Gly Phe Thr Arg Ala Leu Gly Ala Glu Gly Val Glu Glu Val Tyr Gln
79              260                 265                 270
81 Ala Trp Leu Lys Glu Arg Arg Lys Leu Pro Phe Glu Ala Asp Gly Val
82          275                 280                 285
84 Val Val Lys Leu Asp Asp Leu Ala Leu Trp Arg Glu Leu Gly Tyr Thr
85      290                 295                 300
87 Ala Arg Thr Pro Arg Phe Ala Leu Ala Tyr Lys Phe Pro Ala Glu Glu
88 305                 310                 315                 320
90 Lys Glu Thr Arg Leu Leu Ser Val Ala Phe Gln Val Gly Arg Thr Gly
91                  325                 330                 335
93 Arg Ile Thr Pro Val Gly Val Leu Glu Pro Val Phe Ile Glu Gly Ser
94              340                 345                 350
96 Glu Val Ser Arg Val Thr Leu His Asn Glu Ser Phe Ile Glu Glu Leu
97          355                 360                 365
99 Asp Val Arg Ile Gly Asp Trp Val Leu Val His Lys Ala Gly Gly Val
100     370                 375                 380
102 Ile Pro Glu Val Leu Arg Val Leu Lys Glu Arg Arg Thr Gly Glu Glu
103 385                 390                 395                 400
105 Lys Pro Ile Ile Trp Pro Glu Asn Cys Pro Glu Cys Gly His Ala Leu
106                 405                 410                 415
108 Ile Lys Glu Gly Lys Val His Arg Cys Pro Asn Pro Leu Cys Pro Ala
109             420                 425                 430
111 Lys Arg Phe Glu Ala Ile Arg His Tyr Ala Ser Arg Lys Ala Met Asp
112         435                 440                 445
114 Ile Gln Gly Leu Gly Glu Lys Leu Ile Glu Lys Leu Leu Glu Lys Gly
115     450                 455                 460
117 Leu Val Arg Asp Val Ala Asp Leu Tyr Arg Leu Lys Lys Glu Asp Leu
118 465                 470                 475                 480
120 Val Asn Leu Glu Arg Met Gly Glu Lys Ser Ala Glu Asn Leu Leu Arg
121                 485                 490                 495
123 Gln Ile Glu Glu Ser Lys Gly Arg Gly Leu Glu Arg Leu Leu Tyr Ala
124             500                 505                 510
126 Leu Gly Leu Pro Gly Val Gly Glu Val Leu Ala Arg Asn Leu Ala Leu
127         515                 520                 525
129 Arg Phe Gly His Met Asp Arg Leu Leu Glu Ala Gly Leu Glu Asp Leu
130     530                 535                 540
132 Leu Glu Val Glu Gly Val Gly Glu Leu Thr Ala Arg Ala Ile Leu Asn
133 545                 550                 555                 560
135 Thr Leu Lys Asp Pro Glu Phe Arg Asp Leu Val Arg Arg Leu Lys Glu
136                 565                 570                 575
138 Ala Gly Val Glu Met Glu Ala Lys Glu Arg Glu Gly Glu Ala Leu Lys
139             580                 585                 590
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141 Gly Leu Thr Phe Val Ile Thr Gly Glu Leu Ser Arg Pro Arg Glu Glu
142         595                 600                 605
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145     610                 615                 620
147 Ser Arg Lys Thr Ser Phe Leu Val Val Gly Glu Asn Pro Gly Ser Lys
148 625                 630                 635                 640
150 Leu Glu Lys Ala Arg Ala Leu Gly Val Pro Thr Leu Ser Glu Glu Glu
151                 645                 650                 655
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161 <211> LENGTH: 2025
162 <212> TYPE: DNA
163 <213> ORGANISM: Thermus sp.
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168 cttagggagc ttaaggagct ggaggagcgc tttcccgagc tcaaaagccc cgactccccc 180
169 acggaacagg tgggggcgag gcctctggag gccaccttcc gcccggtgcg ccaccccacc 240
170 cgcatgtact ccctggacaa cgccttttcc ttggacgagg tgagggcctt tgaggagcgc 300
171 atagagcggg ccctggggcg gaaggggccc ttcctctaca ccgtggagcg caaggtggac 360
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176 aggaacgccg ccgccgggtc cttgcggcag aaagacccca gggtcacggc caggcggggc 660
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